

Appendix F

Factorial Results for Clay Soil Infiltration Tests

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Table F-1. Factorial Analysis for Infiltration Test, Clay

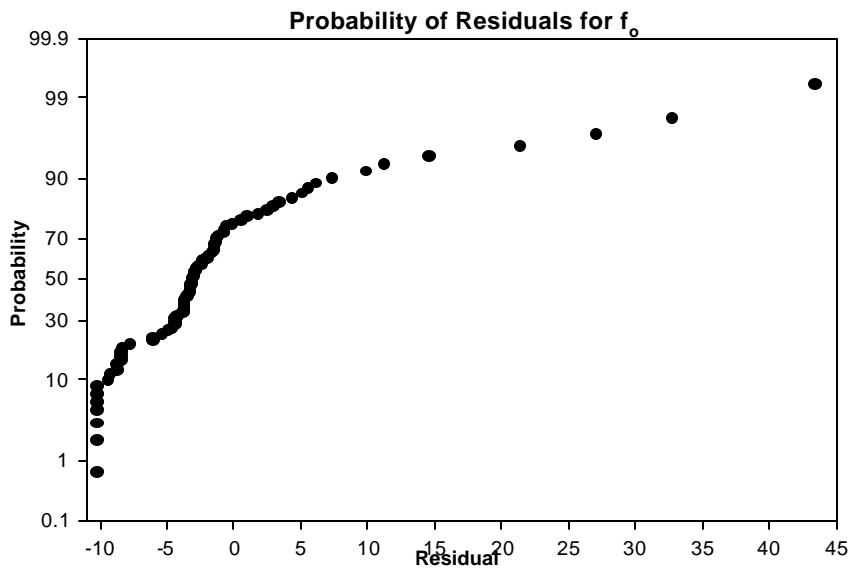
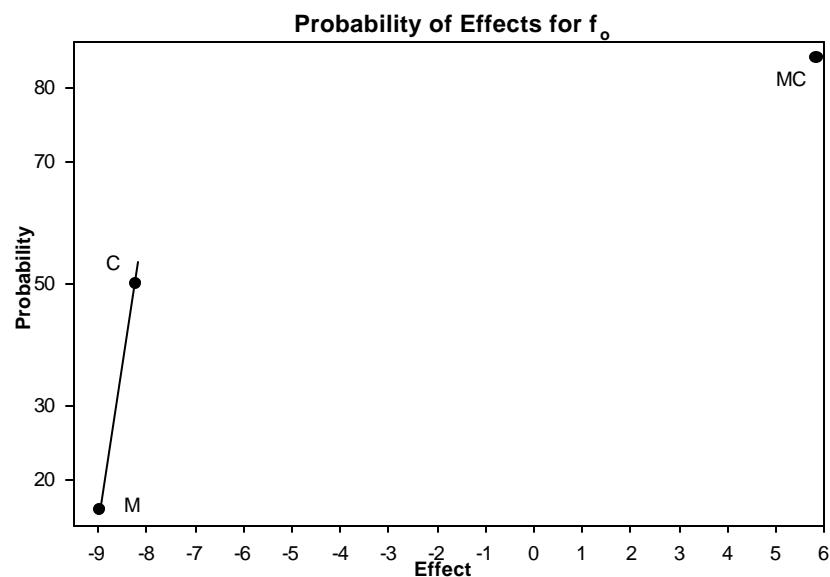
**Figure F-1. Results of Factorial Analysis for f_o
Clay**

Moisture (Wet=+/Dry=-)	Compacted (Yes=+/No=-)	Factorial Group	Average	Standard Error	Number
+	+	1	1.59	0.78	18
+	-	2	3.95	3.48	27
-	+	3	4.70	2.55	15
-	-	4	18.76	7.38	17
overall average			7.25	77	
calculated polled S.E			4.29		

$$f_o = 7.25 \pm (MC/2)$$

Factorial Group	effects	rank	Prob	$f_o = 7.25 \pm (5.85/2)$
M	-8.96	1	16.67	M
C	-8.21	2	50.00	+
MC	5.85	3	83.33	+

M	C	Calculated Values
+	+	10.18
+	-	4.33
-	+	4.33
-	-	10.18



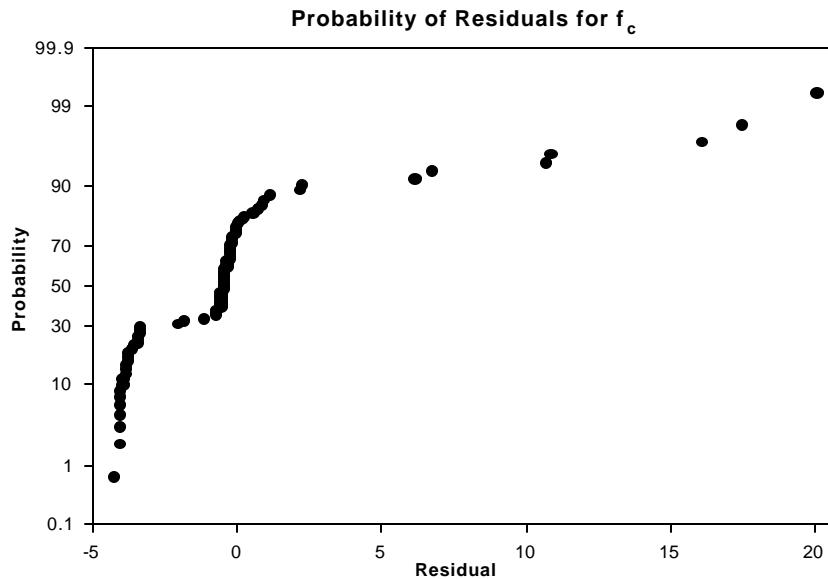
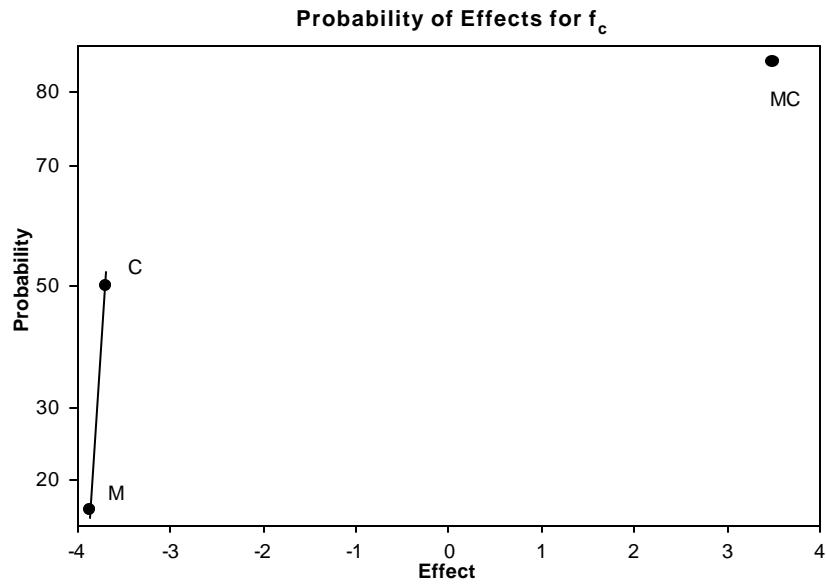
**Figure F-2. Results of Factorial Analysis for f_c
Clay**

Moisture (Wet=+/Dry=-)	Compacted (Yes=+/No=-)	Factorial Group	Average	Standard Error	Number
+	+	1	0.23	0.13	18
+	-	2	0.42	0.50	27
-	+	3	0.60	0.36	15
-	-	4	7.78	3.99	17
overall average			2.26		77
calculated polled S.E			2.02		

$$f_c = 2.26 \pm (MC/2)$$

$$f_c = 2.26 \pm (3.49/2)$$

Factorial Group	effects	rank	Prob	M	C	Calculated Values
M	-3.86	1	16.67	+	+	4.00
C	-3.69	2	50.00	+	-	0.51
MC	3.49	3	83.33	-	+	0.51
				-	-	4.00



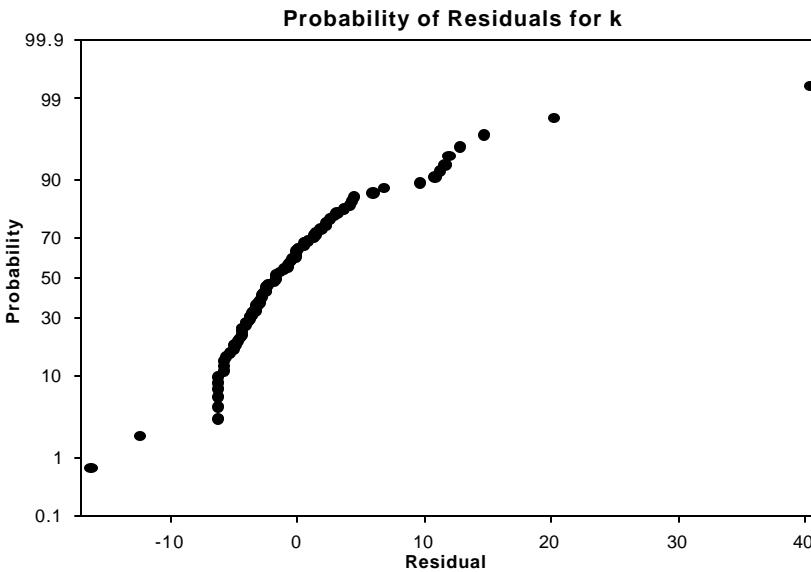
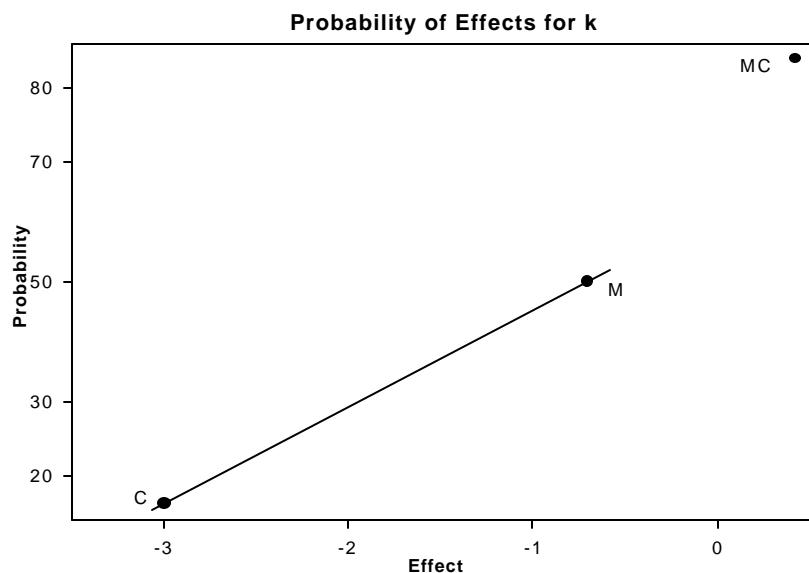
**Figure F-3. Results of Factorial Analysis for k
Clay**

Moisture (Wet=+/Dry=-)	Compacted (Yes=+/No=-)	Factorial Group	Average	Standard Error	Number
+	+	1	4.33	3.33	18
+	-	2	6.87	3.60	27
-	+	3	4.61	1.14	15
-	-	4	8.02	3.86	17
overall average			5.96	77	
calculated polled S.E			3.17		

$$k = 5.96 \pm (MC/2)$$

$$k = 5.96 \pm (0.43/2)$$

	effects sorted	rank	Prob	M	C	Calculated Values
C	-2.99	1	16.67	+	+	6.17
M	-0.70	2	50.00	+	-	5.74
MC	0.43	3	83.33	-	+	5.74
				-	-	6.17



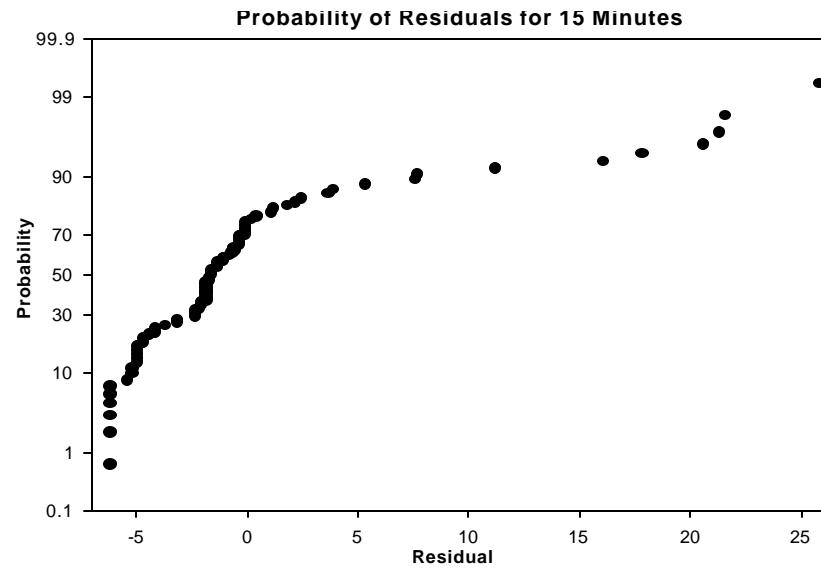
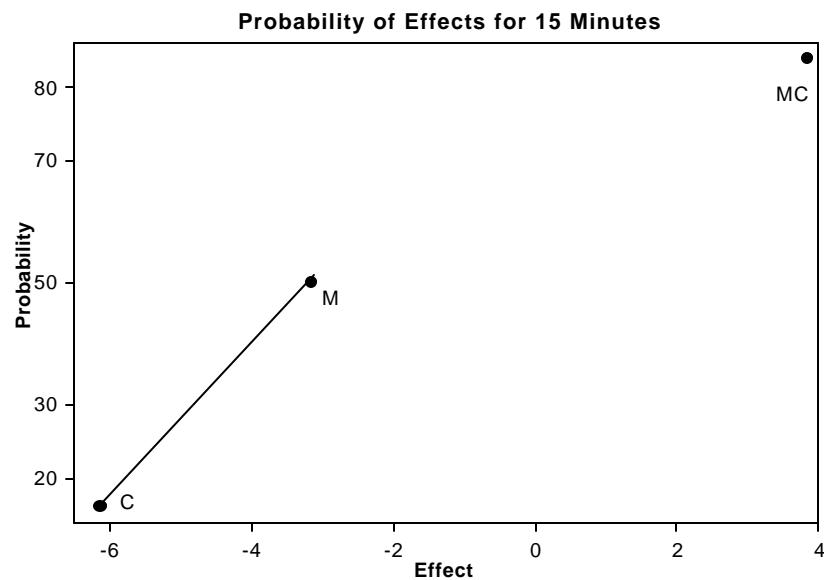
**Figure F-4. Results of Factorial Analysis for Infiltration at 15 Minutes
Clay**

Moisture (Wet=+/Dry=-)	Compacted (Yes=+/No=-)	Factorial Group	Average	Standard Error	Number
+	+	1	1.51	0.70	18
+	-	2	3.79	2.07	27
-	+	3	0.82	0.29	15
-	-	4	10.78	5.21	17
overall average			4.22		77
calculated pooled S.E			2.83		

$$f_{15 \text{ min}} = 4.22 \pm (MC/2)$$

$$f_{15 \text{ min}} = 4.22 + (3.84/2)$$

	effects	rank	Prob	M	C	Calculated Values
C	-6.12	1	16.67	+	+	6.14
M	-3.15	2	50.00	+	-	2.30
MC	3.84	3	83.33	-	+	2.30
				-	-	6.14



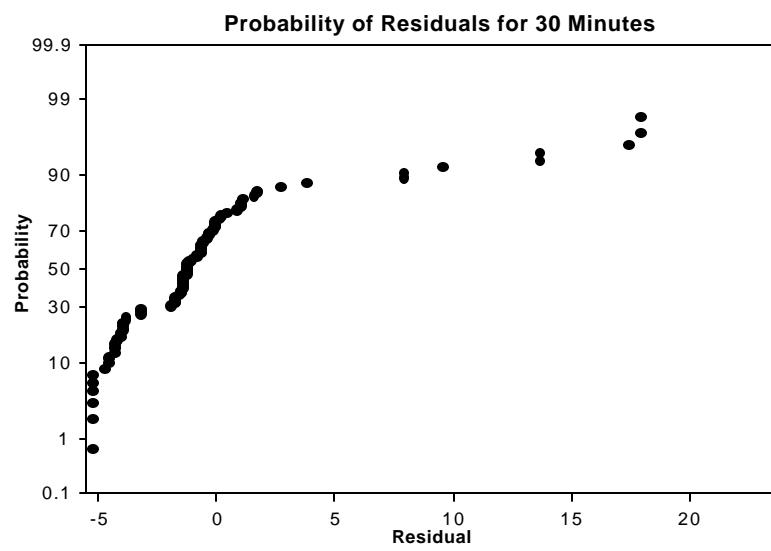
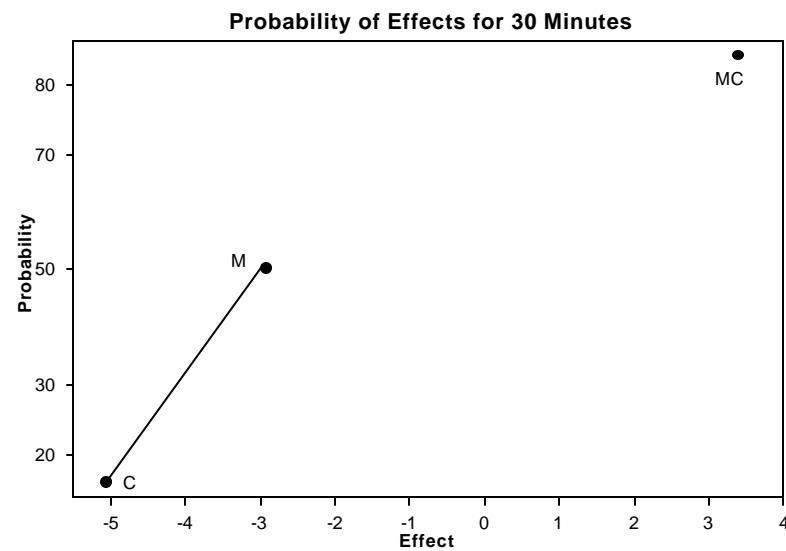
**Figure F-5. Results for Factorial Analysis for Infiltration at 30 Minutes
Clay**

Moisture (Wet=+/Dry=-)	Compacted (Yes=+/No=-)	Factorial Group	Average	Standard Error	Number
+	+	1	1.16	0.51	18
+	-	2	2.81	1.74	27
-	+	3	0.68	0.24	15
-	-	4	9.15	4.55	18
overall average			3.45	78	
calculated polled S.E.			2.45		

$$f_{30 \text{ min}} = 3.45 \pm (MC/2)$$

$$f_{30 \text{ min}} = 3.45 + (3.41/2)$$

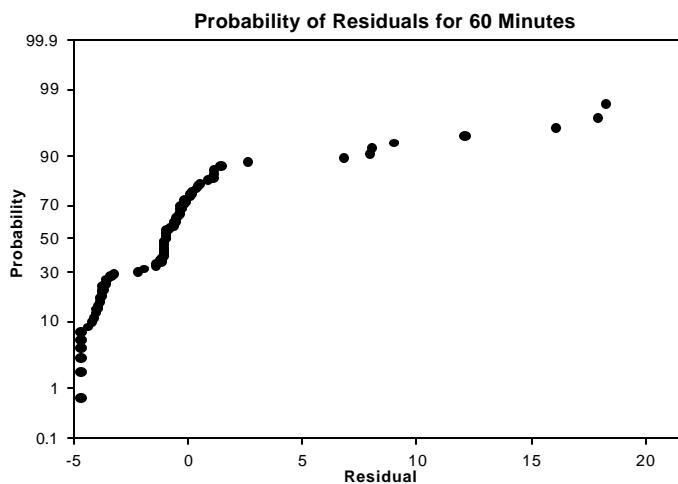
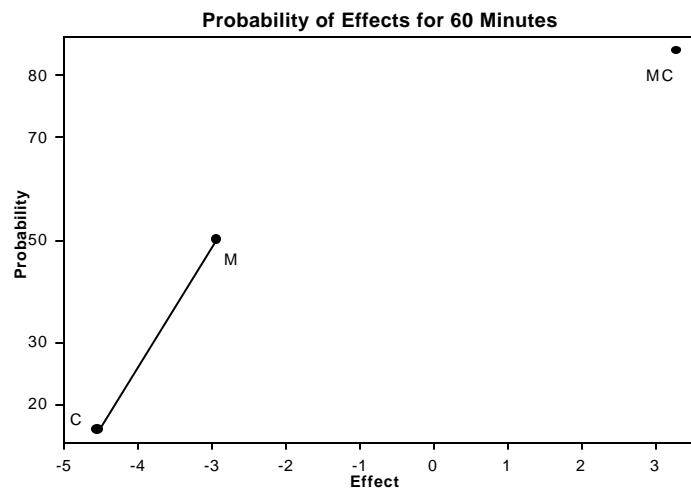
	effects	rank	Prob	M	C	Calculated Values
C	-5.06	1	16.67	+	+	5.15
M	-2.92	2	50.00	+	-	1.74
MC	3.41	3	83.33	-	+	1.74
				-	-	5.15



**Figure F-6. Results of Factorial Analysis for Infiltration at 60 Minutes
Clay**

Moisture (Wet=+/Dry=-)	Compacted (Yes=+/No=-)	Factorial Group	Average	Standard Error	Number
+	+	1	0.90	0.42	18
+	-	2	2.13	1.41	27
-	+	3	0.53	0.19	15
-	-	4	8.34	4.33	18
overall average			2.97		78
calculated pooled S.E.			2.45		

C	M	MC	effects	rank	Prob	$f_{60\ min} = 2.97 \pm (MC/2)$	$f_{15\ min} = 2.97 + (3.29/2)$	Calculated Values					
			-4.53	-2.92	3.29	1	2	3	16.67	50.00	83.33		
									+	-	-	-	4.62
									+	-	-	-	1.33
									-	-	-	-	1.33
									-	-	-	-	4.62



**Figure F-7. Results of Factorial Analysis for Infiltration at 120 Minutes
Clay**

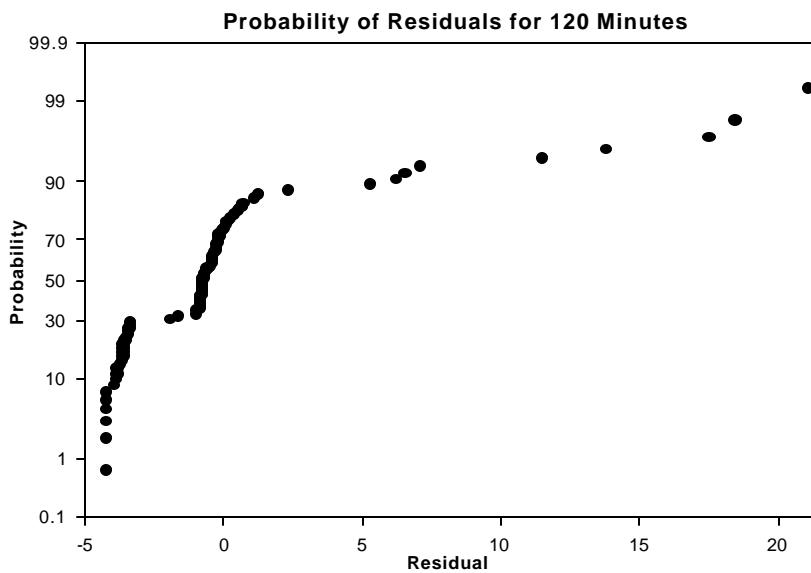
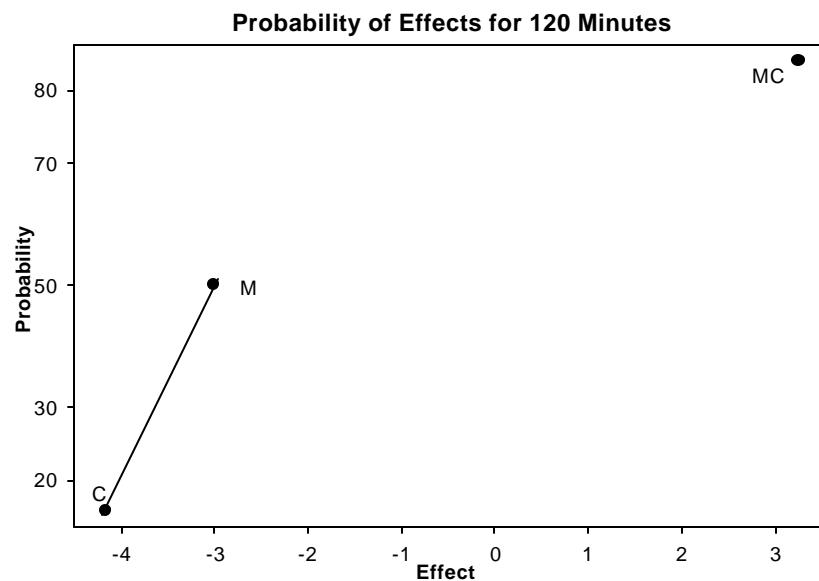
Moisture (Wet=+/Dry=-)	Compacted (Yes=+/No=-)	Factorial Group	Average	Standard Error	Number
+	+	1	0.64	0.42	18
+	-	2	1.55	1.41	27
-	+	3	0.40	0.19	15
-	-	4	7.81	4.33	18
overall average			2.60		78
calculated pooled S.E.			2.45		

	effects	rank	Prob
C	-4.16	1	16.67
M	-3.01	2	50.00
MC	3.25	3	83.33

$$f_{120 \text{ min}} = 2.60 \pm (\text{MC}/2)$$

$$f_{120 \text{ min}} = 2.60 \pm (3.25/2)$$

M	C	Calculated Values
+	+	4.22
+	-	0.97
-	+	0.97
-	-	4.22



**Table F-1. Factorial Analysis for Infiltration Test
Clay**

M (Moisture)	C (Compaction)	Factorial Group	f_c (in/hr)	f_o (in/hr)	k	min 15	min 30	min 60	min 120	
NCWC1A	+	+	1	0.0	0.0	0.0	0.3	0.4	0.3	0.2
NCWC1B	+	+	1	0.0	0.0	0.0	0.5	0.5	0.4	0.2
NCWC1C	+	+	1	0.0	0.0	0.0	0.5	0.3	0.2	0.1
NCWC2A	+	+	1	0.2	4.2	6.2	0.3	0.4	0.3	0.2
NCWC2B	+	+	1	0.3	1.5	6.1	0.5	0.5	0.4	0.2
NCWC2C	+	+	1	0.1	1.5	2.3	0.5	0.3	0.2	0.1
OCWC1A	+	+	1	0.0	0.0	0.0	0.5	0.5	0.4	0.3
OCWC1B	+	+	1	0.0	0.0	0.0	1.0	0.8	0.6	0.4
OCWC1C	+	+	1	0.0	0.0	0.0	0.8	0.4	0.3	0.2
OCWC2A	+	+	1	0.5	4.2	17.9	1.5	1.1	1.0	0.8
OCWC2B	+	+	1	-0.2	0.8	0.5	1.3	1.0	0.8	0.6
OCWC2C	+	+	1	0.3	1.8	1.9	1.8	1.1	0.9	0.7
OCWC3A	+	+	1	0.7	5.6	26.5	1.8	1.4	1.0	0.8
OCWC3B	+	+	1	0.6	1.8	7.1	6.3	4.5	4.0	3.3
OCWC3C	+	+	1	0.4	1.9	1.9	2.0	1.5	1.2	0.9
OCWC4A	+	+	1	0.7	1.8	3.8	2.3	1.8	1.3	0.8
OCWC4B	+	+	1	0.2	1.0	0.6	3.5	2.9	1.8	1.1
OCWC4C	+	+	1	0.3	2.5	3.1	2.3	1.8	1.1	0.7
NCWN1A	+	-	2	0.0	0.0	7.7	1.0	0.5	0.3	0.2
NCWN1B	+	-	2	0.0	0.0	0.0	2.3	1.5	1.1	0.7
NCWN1C	+	-	2	0.0	0.0	0.0	13.5	11.4	9.4	7.5
NCWN2A	+	-	2	0.3	5.4	46.2	2.0	1.4	0.9	0.6
NCWN2B	+	-	2	0.2	6.9	3.4	1.0	0.9	0.8	0.6
NCWN2C	+	-	2	0.3	2.9	2.5	1.5	1.1	0.9	0.8
OCWN1A	+	-	2	6.7	47.8	20.5	0.0	0.0	0.0	0.0
OCWN1B	+	-	2	0.5	8.7	17.1	0.0	0.0	0.0	0.0
OCWN1C	+	-	2	0.1	2.1	8.4	0.0	0.0	0.3	0.2
OCWN2A	+	-	2	0.1	1.2	8.7	1.3	0.9	0.6	0.4
OCWN2B	+	-	2	-0.6	0.7	0.5	1.3	0.6	0.3	0.4
OCWN2C	+	-	2	-0.2	0.6	0.8	2.5	1.3	0.8	0.5
OCWN3A	+	-	2	0.0	1.3	8.1	0.0	0.0	0.0	0.0
OCWN3B	+	-	2	0.0	1.3	8.1	0.0	0.0	0.0	0.0
OCWN3C	+	-	2	0.0	0.9	6.4	0.0	0.0	0.0	0.0
OCWN4A	+	-	2	0.1	1.1	5.4	3.0	2.0	1.3	0.9
OCWN4B	+	-	2	1.4	3.2	3.1	3.0	2.0	1.4	0.9
OCWN4C	+	-	2	1.1	3.7	7.2	11.5	13.1	12.6	10.5
OCWN5A	+	-	2	0.3	4.3	3.5	1.0	0.5	0.5	0.3
OCWN5B	+	-	2	0.3	6.2	12.6	4.0	2.0	1.1	0.6
OCWN5C	+	-	2	-0.2	2.4	0.9	24.0	18.9	13.7	9.5
OCWN6A	+	-	2	0.4	1.0	4.2	10.0	5.6	2.8	1.5
OCWN6B	+	-	2	0.1	1.5	1.3	4.8	2.6	1.8	1.1
OCWN6C	+	-	2	0.2	1.4	1.5	2.3	1.3	0.9	0.6
OCWN7A	+	-	2	0.1	0.7	2.8	4.5	3.4	2.5	1.7
OCWN7B	+	-	2	0.1	0.7	1.8	6.0	3.5	2.3	1.4
OCWN7C	+	-	2	0.1	0.7	2.9	2.0	1.6	1.3	0.8
NCDC1A	-	+	3	0.4	2.8	2.6	0.5	0.4	0.3	0.2
NCDC1B	-	+	3	0.7	2.9	4.1	0.5	0.5	0.3	0.3
NCDC1C	-	+	3	1.3	9.9	9.5	0.5	0.4	0.3	0.2
NCDC2A	-	+	3	0.3	3.1	4.8	1.0	1.0	0.8	0.6
NCDC2B	-	+	3	0.5	7.8	5.7	0.8	0.6	0.4	0.4

**Table F-1. Factorial Analysis for Infiltration Test
Clay (Continued)**

M (Moisture)	C (Compaction)	Factorial Group	f_c (in/hr)	f_o (in/hr)	k	min 15	min 30	min 60	min 120	
NCDC2C	-	+	3	0.0	19.0	6.4	1.3	1.1	0.9	0.6
OCDC1A	-	+	3	0.8	3.6	7.3	1.8	1.3	1.1	0.8
OCDC1B	-	+	3	2.8	9.5	5.9	1.3	0.9	0.7	0.6
OCDC1C	-	+	3	0.6	2.5	4.0	1.3	1.1	0.9	0.7
OCDC2A	-	+	3	0.5	2.9	5.1	1.5	1.3	0.9	0.7
OCDC2B	-	+	3	0.4	1.7	3.0	0.8	0.6	0.6	0.4
OCDC2C	-	+	3	0.3	1.6	1.2	1.3	1.0	0.8	0.6
OCDC3A	-	+	3	0.1	1.1	5.2	0.0	0.0	0.0	0.0
OCDC3B	-	+	3	0.1	1.4	2.3	0.0	0.0	0.0	0.0
OCDC3C	-	+	3	0.2	0.7	2.1	0.0	0.0	0.0	0.0
NCDN1A	-	-	4	6.2	37.3	4.6	2.0	1.9	1.6	1.0
NCDN1B	-	-	4	0.1	17.6	15.9	2.0	1.3	0.8	0.5
NCDN1C	-	-	4	0.2	4.9	19.1	2.8	2.0	1.4	0.8
NCDN2A	-	-	4				2.3	1.8	1.5	1.3
NCDN2B	-	-	4	0.6	9.7	12.2	2.5	2.3	1.9	1.6
NCDN2C	-	-	4	0.6	7.9	10.7	0.8	0.4	0.3	0.2
OCDN1A	-	-	4	14.9	31.6	2.6	5.5	4.5	3.8	3.6
OCDN1B	-	-	4	21.5	21.5	-6.2	22.3	18.9	16.8	15.8
OCDN1C	-	-	4	20.1	20.1	-10.0	32.0	29.0	26.5	25.3
OCDN2A	-	-	4	10.8	16.4	4.9	4.5	3.3	2.5	2.3
OCDN2B	-	-	4	5.0	13.2	10.6	4.5	3.6	2.8	2.6
OCDN2C	-	-	4	5.2	10.8	10.4	2.0	1.4	1.1	0.8
OCDN3A	-	-	4	0.7	7.0	17.1	7.3	6.3	5.8	5.5
OCDN3B	-	-	4	2.2	5.3	3.7	8.0	6.3	5.8	5.3
OCDN3C	-	-	4	2.0	6.0	5.5	13.8	13.1	11.5	11.3
OCDN4A	-	-	4	24.1	43.0	7.6	27.8	22.6	22.9	21.8
OCDN4B	-	-	4	14.7	57.8	18.2	27.5	23.1	22.6	22.7
OCDN4C	-	-	4	3.3	8.9	9.4	26.8	23.1	20.8	18.0

group statistics	f_c (in/hr)	f_o (in/hr)	k	min 15	min 30	min 60	min 120
1 average	0.2	1.6	4.3	1.5	1.2	0.9	0.6
1 std error	0.1	0.8	3.3	0.7	0.5	0.4	0.3
1 number	18.0	18.0	18.0	18.0	18.0	18.0	18.0
2 average	0.4	4.0	6.9	3.8	2.8	2.1	1.5
2 std error	0.5	3.5	3.6	2.1	1.7	1.4	1.1
2 number	27.0	27.0	27.0	27.0	27.0	27.0	27.0
3 average	0.6	4.7	4.6	0.8	0.7	0.5	0.4
3 std error	0.4	2.5	1.1	0.3	0.2	0.2	0.1
3 number	15.0	15.0	15.0	15.0	15.0	15.0	15.0
4 average	7.8	18.8	8.0	10.8	9.1	8.3	7.8
4 std error	4.0	7.4	3.9	5.2	4.6	4.3	4.2
4 number	17.0	17.0	17.0	18.0	18.0	18.0	18.0

**Table F-1. Factorial Analysis for Infiltration Test
Clay (Continued)**

	f_c (in/hr)	f_o (in/hr)	k	min 15	min 30	min 60	min 120
overall average	2.3	7.3	6.0	4.2	3.4	3.0	2.6
total obs	77.0	77.0	77.0	78.0	78.0	78.0	78.0
calc. polled S.E. based on averages of replicates	2.0	4.3	3.2	2.8	2.5	2.3	2.2
Moisture	M	-3.9	-9.0	-0.7	-3.1	-2.9	-2.9
Compaction	C	-3.7	-8.2	-3.0	-6.1	-5.1	-4.5
moisture x compaction	MC	3.5	5.9	0.4	3.8	3.4	3.3
							3.2